

What Is Claim Is:

1. A method of controlling a generator system connected to an electric power system, comprising:
  - measuring an output frequency characteristic of the generator system;
  - estimating a first phase angle of the measured frequency characteristic using a first phase locked loop having a first bandwidth;
  - estimating a second phase angle of the measured frequency characteristic using a second phase locked loop having a second bandwidth greater than the first bandwidth;
  - calculating a phase shift between the estimated first and second phase angles;
  - and
  - determining whether or not the generator system is within a generation island based on the calculated phase shift.
2. The method according to claim 1, further comprising:
  - stopping the generator system from delivering electric power to the electric power system if the determining step determines the generator system is within a generation island.
3. The method according to claim 1, wherein the determining step determines the generator system is within a generation island if an absolute value of calculated phase shift is greater than a predetermined threshold.
4. The method according to claim 3, wherein the predetermined threshold is  $\pi/2$ .
5. The method according to claim 1, wherein the first and second bandwidths are approximately 1 Hz and 10 Hz, respectively.
6. The method according to claim 1, wherein the determining step determines whether or not the generator system is within a generation island in less than 1 second.

7. A system for controlling a generator system connected to an electric power system, comprising:
- means for measuring an output frequency characteristic of the generator system;
  - means for estimating a first phase angle of the measured frequency characteristic using a first phase locked loop having a first bandwidth;
  - means for estimating a second phase angle of the measured frequency characteristic using a second phase locked loop having a second bandwidth greater than the first bandwidth;
  - means for calculating a phase shift between the estimated first and second phase angles; and
  - means for determining whether or not the generator system is within a generation island based on the calculated phase shift.
8. The system according to claim 7, further comprising:
- means for stopping the generator system from delivering electric power to the electric power system if the determining means determines the generator system is within a generation island.
9. The system according to claim 7, wherein the determining means determines the generator system is within a generation island if an absolute value of calculated phase shift is greater than a predetermined threshold.
10. The system according to claim 9, wherein the predetermined threshold is  $\pi/2$ .
11. The system according to claim 7, wherein the first and second bandwidths are approximately 1 Hz and 10 Hz, respectively.
12. The system according to claim 7, wherein the determining means determines whether or not the generator system is within a generation island in less than 1 second.

13. In a generator system connected to an electric power system, the improvement comprising:

a measuring circuit configured to measure an output frequency characteristic of the generator system;

a first phase locked loop having a first bandwidth and configured to estimate a first phase angle of the measured frequency characteristic;

a second phase locked loop having a second bandwidth greater than the first bandwidth and configured to estimate a second phase angle of the measured frequency characteristic;

a calculating circuit configured to calculate a phase shift between the estimated first and second phase angles; and

a determining circuit configured to determine whether or not the generator system is within a generation island based on the calculated phase shift.

14. The system according to claim 13, further comprising:

a disconnecting circuit configured to stop the generator system from delivering electric power to the electric power system if the determining circuit determines the generator system is within a generation island.

15. The system according to claim 13, wherein the determining circuit determines the generator system is within a generation island if an absolute value of calculated phase shift is greater than a predetermined threshold.

16. The system according to claim 15, wherein the predetermined threshold is  $\pi/2$ .

17. The system according to claim 13, wherein the first and second bandwidths are approximately 1 Hz and 10 Hz, respectively.

18. The system according to claim 13, wherein the determining circuit determines whether or not the generator system is within a generation island in less than 1 second.